
Before the
Federal Communications Commission
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of

Amendment of the Commission's Rules to
Establish New Personal Communications
Services

) GEN Docket No. 90-314
) ET Docket No. 92-100

ORIGINAL
FILE

COMMENTS OF U S WEST, INC.

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SUMMARY

U S WEST proposes that the Commission adopt a flexible regulatory approach to PCS, thereby encouraging innovation, creating a robust and competitive marketplace, and improving the position of the United States in international telecommunications markets. The principal positions advocated by U S WEST are:

- Allocate four 25 MHz blocks of spectrum for PCS licensees, at least 20 MHz for low-power unlicensed PCS, and 20 MHz for a reserve.
- License one 25 MHz block by Major Trading Areas, and the remaining three 25 MHz blocks on the basis of MSAs and RSAs.
- Select licensees by lottery and allow free transferability of licenses.
- Encourage industry groups to develop standards for interoperability and interconnection.
- Allow local exchange carriers to be eligible for PCS licenses where they provide telephone service, whether or not their affiliates provide cellular service.

The recommendation of 25 MHz blocks represents a reasonable compromise between efficient use of scarce spectrum and providing enough spectrum to each provider for high-quality, low-cost service. An allocation of at least 20 MHz for unlicensed PCS should be adequate to meet initial customer needs for in-building wireless voice services.

Based on the projected demand for new services, U S WEST proposes that four PCS licenses be authorized in any given area because the market will not support a greater number. The Commission should reserve approximately 20 MHz of spectrum and three years after the first PCS license grant conduct a further phase in this proceeding to determine how to use the reserved spectrum.

In order to encourage the development of new technologies and make a wide variety of services available at reasonable prices, the Commission should allow PCS licensees a high degree of technical flexibility. This would permit development of both high-power and low-power services in response to customer needs. U S WEST urges the Commission to encourage the industry to develop standards for interoperability and interconnection.

U S WEST proposes that the Commission license one block of spectrum by Major Trading Areas and three blocks by MSAs and RSAs. The differing geographic scope of licenses will encourage the establishment of different types of service. Major Trading Area systems are likely to be competitive with regional cellular systems, while MSA/RSA systems are likely to address customer needs for locally-oriented low-mobility services.

U S WEST believes that lotteries are the only realistic means for licensing PCS promptly. To minimize speculation, the Commission should require the payment of a substantial filing fee and require applicants to show current unconditional availability of funds. To prevent warehousing of spectrum, the Commission should impose deadlines for system construction and build-out. Moreover, the Commission should not impose any

limitations on license transferability other than the requirement of prior Commission approval.

U S WEST believes that a policy of open eligibility for PCS licenses will best serve the public interest and the goals of this proceeding. Specifically, local exchange carriers should be eligible for PCS licenses. Substantial benefits would flow from making local exchange carriers eligible for PCS licenses. They have valuable experience and are fully committed to providing high-quality services to businesses and residential consumers over the long term. Their existing facilities form the basis for PCS infrastructure, and they should be encouraged to develop these facilities for use in support of their own and others' PCS systems. Open eligibility will allow all potential infrastructure providers — including cable operators, telephone companies, and others — to develop their plant suitably for PCS infrastructure.

A local exchange carrier's affiliation with a cellular carrier is not a valid basis for restricting eligibility. Cellular and PCS are different services. Telephone companies do not have ready access to cellular spectrum because their affiliated cellular operations are typically partnerships, and no individual partner has access to the partnership's spectrum. The Commission should not preclude local exchange carrier eligibility from an entire PCS service area merely because an affiliate has a cellular presence in a portion thereof.

Local exchange carriers are facing increasing competition in their home markets. Competitive access providers, cable television operators, fiber optic networks, and long distance providers are becoming increasingly involved in the local service market. For example, AT&T is poised to take a central position in the cellular service industry. The telephone companies must have the same access to spectrum and technology as their competitors have in order to stay competitive.

Finally, local exchange carrier eligibility would be consistent with the international telecommunications trade policies of the United States and would serve the national interest by making American companies more competitive in the international wireless services arena.

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U S WEST, Inc. ("U S WEST"), by its attorneys and on behalf of itself and two of its wholly-owned subsidiaries, U S WEST Communications, Inc. ("USWC") and U S WEST NewVector Group, Inc. ("NewVector"), ^{1/} hereby submits these initial comments in response to the Federal Communications Commission's ("Commission" or "FCC") *Notice of Proposed Rulemaking and Tentative Decision ("NPRM")* in the above-captioned proceeding. ^{2/}

I. INTRODUCTION

U S WEST has a unique perspective on Personal Communications Services ("PCS"), not only because of its involvement in providing and developing a wide variety of personal communications services — wired and wireless, domestic and international — but also because it approaches the subject from the viewpoint of consumer needs and demands, rather than technology.

USWC offers a wide array of local telecommunications services focused on meeting residential and business needs throughout fourteen states. NewVector offers cellular

^{1/} USWC provides exchange telecommunications and exchange access services. NewVector provides cellular, paging and other mobile services. U S WEST itself is a holding company and provides no services to the public.

^{2/} See *Notice of Proposed Rulemaking and Tentative Decision*, 7 FCC Rcd. 5676 (1992).

and paging services to address the mobility needs of consumers in many parts of the country. U S WEST is also involved in bringing cellular services to customers in Hungary, the Czech and Slovak Republics, and Russia. In addition, U S WEST has cable television interests in Sweden, Norway, France and the United Kingdom and is introducing a variety of telecommunications services through the cable systems in the United Kingdom. Most relevant to this proceeding, U S WEST is the 50% owner of Mercury Personal Communications, Ltd., which is one of the two remaining licensees developing Personal Communications Networks ("PCN") in the United Kingdom. Thus, U S WEST draws on a wide range of experience in assisting the Commission in its efforts to develop the regulatory structure for PCS.

Based on its own research and that of other companies, U S WEST believes that there is a substantial demand for a wide variety of PCS products and services. These products and services will address consumer needs to manage their time, be in touch, control their communications options, and be secure. No single communications product or service can meet all of these needs, but a broad range of services from competing providers will allow users to choose the appropriate combination of price, quality, features, and coverage.

The proposals in these Comments reflect U S WEST's desire to assist the Commission in furthering the values of universality, speed of deployment, diversity of service and competitive delivery. By adopting these proposals, the Commission will encourage innovation and enable the creation of a robust and competitive marketplace, thereby best serving the telecommunications needs of the public. Moreover, an open and competitive domestic marketplace will make America a stronger competitor in the world telecommunications market.

In the following section, U S WEST addresses the PCS licensing process. Thereafter, U S WEST addresses the issue of local exchange carrier eligibility.

II. PCS LICENSING AND SPECTRUM ALLOCATION ISSUE

The Commission invited comments on a number of PCS licensing and related regulatory issues. The specific major recommendations of U S WEST, as explained in the following sections, are that the Commission should:

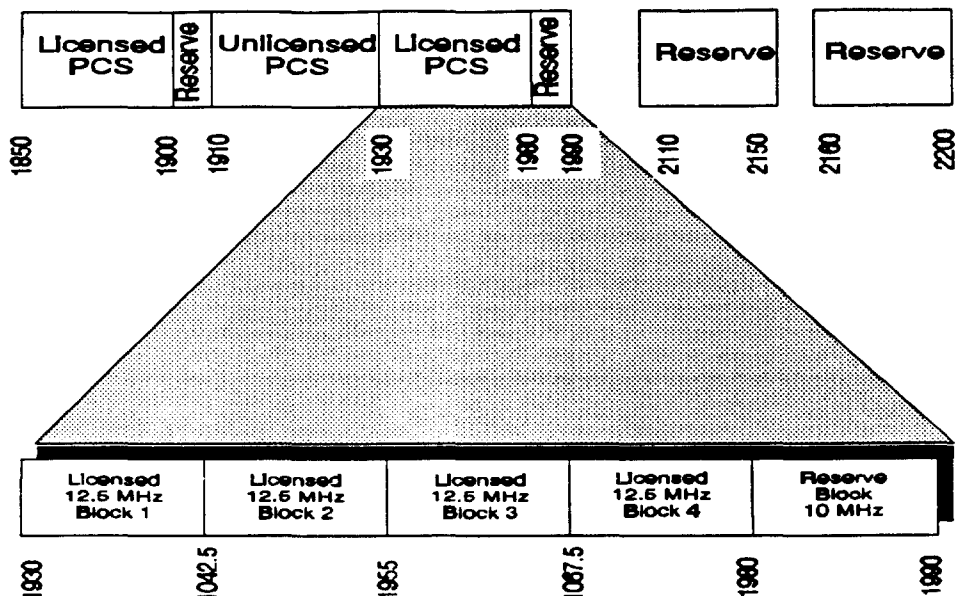
- Allocate 100 MHz for four licensed PCS providers (25 MHz each), allocate at least 20 MHz for low-power unlicensed PCS, and retain the remaining spectrum in reserve.
- Use Major Trading Areas for licensing one of the four 25 MHz PCS providers and use MSAs and RSAs for licensing the other three 25 MHz providers.
- Select PCS licensees by "qualified" lotteries and permit free transferability of PCS licenses.
- Encourage industry-developed standards for interoperability and interconnection.

A. The Commission Should License Four 25 MHz PCS Providers, Allocate At Least 20 MHz For Unlicensed PCS, And Hold the Remainder In Reserve

U S WEST suggests that the Commission allocate 100 MHz of spectrum for licensed PCS providers, in four blocks of 25 MHz, as well as at least 20 MHz for unlicensed use.^{3/} The remaining spectrum in the 1850-1990 MHz band should be held in reserve for future requirements. This represents an appropriate balancing of the goals of universal, low-cost service with the need to conserve spectrum resources and encourage the deployment of efficient technology. The suggested channelization plan is shown in the figure below.

^{3/} One alternative U S WEST has considered is "commodity" PCS. After much thought and discussion, U S WEST recognizes a number of benefits to the "commodity" approach. However, U S WEST has also identified a number of risks and disadvantages, and it is for these reasons we have recommended specific spectrum allocations instead of the "commodity" approach. U S WEST outlines "commodity" PCS in Appendix B and invites other parties to comment.

PCS Channelization Plan



This channelization plan provides for 100 MHz of licensed spectrum for PCS. The 1850-1900 MHz band is paired with the 1930-1980 MHz band to match the 80-MHz frequency offset used in the operational fixed service (OFS) band (only the 1930-1980 MHz half is shown subdivided in the figure). The 1910-1930 MHz band is designated for unlicensed PCS applications. The paired 1900-1910 and 1980-1990 MHz bands, as well as the 2110-2150 and 2160-2200 MHz bands, are held in reserve.

1. 25 MHz is Appropriate For Each PCS Licensee

In recommending 25 MHz blocks of spectrum for each PCS licensee, U S WEST is well aware that there is no single answer to how much spectrum is "right" — any spectrum allocation decision is a compromise among competing objectives and demands. Designing PCS systems to offer a wide array of consumer products involves compromises and trade-offs among competing objectives. Smaller spectrum assignments will result in higher costs and

lower capacity for a given level of quality and coverage. Larger spectrum assignments may enable licensees to lower costs, increase capacity and improve quality. If PCS is to achieve its potential as a mass-market array of customer-oriented services, then minimizing costs — both initial costs and the costs of expansion — must be an important factor in determining the appropriate allocation.

For example, the low-power radio system designed by Bellcore requires a minimum of 20 MHz to provide the required quality of service.⁴ However, the system is designed to provide voice quality equivalent to wireline service with a 0.99 probability of coverage. While a system could be configured to operate with less than 20 MHz, the issue is how much spectrum is required to provide a high-quality service at a price attractive to consumers. If the same Bellcore system were redesigned to operate with 10 MHz, the cost of the radio components could increase by 25-50%. In addition, it is likely that the probability of coverage would be reduced to as low as 0.9, which is inferior to current cellular service. U S WEST therefore submits that a minimum of 20 MHz is required to provide the necessary quality of service.⁵

Additional spectrum will be needed beyond the baseline requirement of 20 MHz to accommodate peak traffic conditions (e.g., "hot spots" like stadiums and transportation

⁴ D.C. Cox, *A Radio System Proposal for Widespread Low-Power Tetherless Communications*, 39 IEEE TRANS. ON COMMS. No. 2 (Feb. 1991).

⁵ Another important quality parameter is end-to-end delay, which is familiar to users of satellite communications. The Bellcore design contributes less than 10 milliseconds of round-trip delay, a considerable improvement over digital cellular systems, which typically contribute on the order of 200 milliseconds of round-trip delay. While the digital cellular delay is not as significant as the delay on a satellite circuit, it nevertheless will degrade quality and reduce network performance.

centers) and services other than voice communications. ^{6/} In determining how much more spectrum to allocate, the Commission must balance the resulting cost and efficiency improvements against the scarcity of spectrum. U S WEST suggests that an additional 5 MHz is an appropriate compromise.

Because a 20 MHz allocation would allow only 10 voice channels per cell site, it would be difficult to provide capacity for peak traffic loads. With an additional 5 MHz of spectrum, 20-30 voice channels could be activated at critical cell sites, ^{7/} which would also increase the trunking efficiency of the cell sites.^{8/} Without the additional 5 MHz of spectrum, the system would be forced to "borrow" frequencies from adjacent cell sites. This would leave the adjacent areas without service while their frequencies are being "borrowed." While this process can be managed with dynamic channel allocation software, it leads to additional costs and increases the risk of lower service quality. Moreover, the additional 5 MHz of spectrum would permit PCS to accommodate newly emerging data transmission demands, which are expected to be very large and which may not be accounted for in the projections of peak traffic loads.

Cost and efficiency are not the only factors. A PCS system designer must have flexibility to meet different types of customer needs because, while PCS systems can be

^{6/} In addition to the very real need to serve peak traffic loads, the allocation should also provide room to accommodate additional services such as low to moderate-speed data transmission, which is a rapidly increasing customer requirement.

^{7/} This applies to single cells within a reuse cluster. Depending on interference conditions, between 4 to 15% of the cells could have additional channels.

^{8/} Adding channels not only increases the absolute number of voice channels but also increases the cell site's trunking efficiency. For example, 10 channels can support only 4.46 Erlangs of traffic (Erlang B). With 20 channels, 12.03 Erlangs of traffic can be supported (a 169% increase), and with 30 channels, 20.34 Erlangs can be supported (a 356% increase). This means that with 5 MHz of additional spectrum, the Bellcore system could support nearly 5 times more users in specific areas.

designed to satisfy many different price/functionality combinations, differing needs may dictate different design approaches. ^{9/} High-mobility service that can compete with cellular for customers willing to pay for vehicular communications will not satisfy the needs of landline customers because of its expense. ^{10/} Low-price, low-mobility service attractive to landline customers would not be competitive with cellular service because cellular customers need high-mobility service despite its higher price. It is unlikely, therefore, that a single type of PCS system will have both cellular-like functionality and landline-like price. The PCS licensees should have sufficient spectrum to give the licensee the flexibility to decide on the particular combination of prices and services that most appropriately address the market's needs. If there is insufficient spectrum, costs will rise and prices will rise but the range of services that can be offered narrows. So, too, the market for PCS narrows, because higher-priced services will not be attractive to some customers. U S WEST submits that an allocation of 25 MHz, which is consistent with the spectrum allocation for cellular providers, is the optimum spectrum for allowing each PCS provider to choose from a wide range of price, functionality and design approaches.

2. 20 MHz or More Should be Allocated For Unlicensed PCS

In addition to licensed spectrum, U S WEST strongly supports the allocation of at least 20 MHz of unlicensed spectrum for PCS. An allocation of 20 MHz should be adequate to meet the *initial* demand for in-building, wireless voice services. However, demand for emerging data and image applications may warrant the allocation of additional

^{9/} For example, a PCS system can be designed to satisfy customer needs as an alternative to either landline service or cellular service, but it might be difficult to achieve both in the same system.

^{10/} High-mobility service requires large cells with hand-off capability suited to vehicular traffic. This requires complex equipment and supporting systems that increase the cost of both service and customer equipment.

unlicensed spectrum. EO Inc., whose investors include AT&T, Matsushita and Toshiba, recently announced the introduction of low cost personal communicators with wireless communications capabilities.^{11/} Based on the projected sales of personal communicators by EO and its competitors, data requirements may exceed the capacity of an initial 20 MHz allocation.

Whether the Commission allocates 20 MHz or a greater amount of spectrum for unlicensed services, it will be necessary to adopt equipment standards to enable the most efficient use of this spectrum. For this reason, the Commission should require that the equipment be certified or type accepted. The criteria for certification should include both low maximum power limits and the use of a spectrum protocol to minimize interference. An integral part of this protocol would be a requirement to listen before transmitting.

U S WEST does not support the Commission's proposal to channelize the unlicensed band. Channelization will further segment the spectrum, thereby reducing total spectrum efficiency. It would also penalize those technologies which are not optimized for the chosen channelization. This is counter to the Commission's goal of diversity of service. U S WEST also opposes the overlay scheme because it is inefficient. For example, four inappropriately located 100 kHz channels could prevent any 10-MHz system from operating in the band in the same area.

A simpler and more equitable solution would be to require any equipment to use a standard spectrum protocol which acquires spectrum starting at the bottom of the band. When spectrum becomes available immediately below an active channel, the system would

^{11/} Ken Yamada, *Firms to Unveil Hand-Held Computers with Electronic 'Pens' and Phone Lines*, Wall Street Journal, Nov. 2, 1992, at B4.

retune to the lower channel, thereby making more room available at the top of the band. ^{12/} This methodology will allow the unlicensed PCS band(s) to be used much more efficiently than is possible under current Part 15 Rules.

In addition to the use of a spectrum protocol, U S WEST recommends that the unlicensed band be structured to accommodate both standard and non-standard air interfaces. This will allow the use of a single handset, or other terminal device, in both licensed and unlicensed domains, while also allowing the use of proprietary interfaces which may be appropriate for such applications as high-speed data.

3. There Should be Four Licensed PCS Providers

U S WEST suggests that four is the appropriate number of PCS licensees (each with 25 MHz). This recommendation is based upon U S WEST's analysis of the potential total market demand and market share for each licensee. U S WEST's research concludes that approximately 27% of the population of the United States will use a variety of public wireless voice services by the year 2005, including current service offerings such as paging and cellular, as well as new PCS service offerings, such as pedestrian two-way service and CT-2 Plus (outbound-only service combined with a pager). This research also establishes that the market for existing services in the absence of new services would reach a saturation point at about 21% of the population. The introduction of new services would cause the market to grow by approximately 30% to an overall saturation level of 27%. In addition, public research

^{12/} This is analogous to dynamic disk defragmentation, which is used to increase the efficiency of data storage devices such as magnetic disks.

supports U S WEST's findings relative to total market demand for wireless public voice mobility services with estimates ranging from 21 to 37%. ^{13/}

U S WEST has concluded, based on its economic modeling of demand and costs, ^{14/} that a minimum 11 to 14% total market saturation penetration for new forms of PCS must be achieved before four new PCS providers can be viable. ^{15/} U S WEST's research suggests that even with competition from PCS, cellular penetration could reach 14%. If 14% is subtracted from the total wireless penetration assumption of 27%, the new PCS services would reach a penetration of only 13%. At this level the market could not support more than four PCS providers. ^{16/}

Moreover, authorizing more than four PCS licensees initially would not leave significant spectrum in the 1850-1990 MHz band as a reserve for the future. This would impede the Commission's ability to shape its spectrum allocation to the needs of the

^{13/} See E.Y. Snowden (Pacific Bell Telephones, Inc.), Looking Ahead: The Economic Impact of New Network Capabilities, Presentation before the Telocator Conference (Sept. 22, 1992); Telocator PCS Section, Customer Requirements Subcommittee, Marketing and Consumer Affairs Committee, PCS Demand Forecast (May 1992); Shosteck Associates, Mobile Radio and Cellular Seminar, 1992 CTIA Convention (Feb. 9-10, 1992); The Yankee Group, Wireless/Mobile Planning Service (1992); BIS Strategic Decisions and Arthur D. Little, Wireless Personal Communications (Oct. 30-31, 1991); Data Quest, Personnel Communications: A New Market Opportunity — Dataquest Defines the Battleground, 1991 Dataquest Telecommunications Industry Conference (Aug. 12-13, 1991).

^{14/} U S WEST has developed a model to test the economic viability of the PCS market in general and a single PCS Licensee in particular under various demand and cost assumptions. The model's underlying assumptions are set forth in Appendix A hereto.

^{15/} U S WEST characterizes "viability" as the saturation penetration that would allow four competitors with equal market share to realize neutral net present value on their investment.

^{16/} The experience of the United Kingdom suggests that a relatively high number of initial competitors alone will not necessarily lead to a highly competitive market for the ultimate provision of service. More specifically, in the United Kingdom three PCS licenses were granted and only two remain. In addition, four CT-2 licenses were authorized and only one CT-2 system is currently operating.

marketplace as PCS evolves, and it could be wasteful of scarce spectrum. Instead, the Commission should license four 25 MHz providers, designate at least 20 MHz for unlicensed PCS, and reserve the spectrum remaining in the 1850-1990 MHz band for future use. There are widely varying estimates of the demand for PCS. A spectrum reserve will allow the market to develop and a more realistic assessment of demand to be made when PCS has become a viable industry. Until that time, the spectrum reserve would be an appropriate location for PCS experimentation.

U S WEST proposes that three years after the first award of a PCS license, comments be accepted in a further phase of this proceeding. This further rulemaking would lead to the adoption of a further *Report & Order* deciding whether to make this spectrum available to existing PCS licensees or license additional competitors.

4. Power and Height Standards for PCS Licensees Should be Flexible

A major goal of the Commission in this proceeding is to encourage the development of new, spectrum-efficient technologies that will provide the public with a wide variety of new, high-quality telecommunications services at reasonable prices. The Commission expects the providers of these new services to offer some measure of competition to the two existing cellular service providers, as well as making new varieties of service available. The Commission should give PCS licensees a considerable degree of flexibility in determining how best to meet the needs of their particular customer bases. Rather than dictate that high or low power be used, the Commission should allow the licensees to determine what power level is optimal for a particular application.

Accordingly, U S WEST supports the height and power levels described in paragraph 116 of the *NPRM*, because these would give the licensee the flexibility to choose either high-power or low-power operation, thereby permitting PCS to serve a wider variety

of customer needs. However, as noted in Section II.D.2 below, U S WEST strongly supports requiring adherence to a common air interface(s) in the licensed PCS bands.

U S WEST also supports the need for frequency coordination in the licensed bands. ^{17/} This includes both PCS-to-OFS and PCS-to-PCS coordination. The FCC should require prior coordination of new systems in a manner similar to that prescribed in Part 21.100 of the Rules.

While frequency coordination is a necessity, it must be recognized that the task will become more complex and expensive in a shared environment. Coordination among PCS users with dissimilar radio systems and/or power levels will be more difficult than coordination among similar systems. U S WEST also supports the use of a 47 dBu signal level limit at the boundary of each service area. ^{18/}

B. One Block of 25 MHz Should Be Licensed by Major Trading Areas, and the Other Three Blocks Should Be Licensed by MSAs and RSAs

Just as there is no single “best” spectrum allocation, there is no single “best” area for licensing PCS. U S WEST proposes that the Commission adopt a blend of approaches that will both speed delivery of service and make possible a greater diversity of services and service providers. Specifically, the Commission should issue licenses for one block of spectrum on the basis of Major Trading Areas, while the other three blocks of spectrum should be licensed by MSAs and RSAs.

Both approaches should be adopted because their differing geographic scope will allow different types of PCS to be developed. Major Trading Areas will tend to encourage the establishment of regional PCS systems with seamless coverage over broad areas, offer

^{17/} *NPRM*, 7 FCC Rcd. at 5722, ¶ 120.

^{18/} *Id.*

services attractive to users with high-mobility communications needs, and offer additional competitive alternatives to existing cellular services. The MSA/RSA licensing approach, on the other hand, will tend to encourage the establishment of different forms of PCS, specifically, localized low-mobility services that are not currently available from cellular licensees. Using the two different service area definitions can thus encourage a diversity of system design approaches without imposing particular design philosophies and technologies on PCS system developers through regulations that unnecessarily limit their flexibility. In other words, instead of mandating that PCS be offered as a low-power service or a high-power service, thereby tying the hands of licensees, the Commission can provide a framework for the development of PCS systems that serve the needs of different types of customers while allowing system designers and engineers to use the best technological approach for meeting the needs of their customers in a particular geographic area.

Of all the options set forth by the Commission, the one that appears to have the greatest potential to speed delivery of service is the Major Trading Areas. Only 49 service areas would have to be licensed,^{19/} thereby reducing the Commission's administrative burdens. These are diverse markets, each containing at least one major population center, and they are organized on the basis of regional business, marketing and shopping patterns. While there are some anomalies, Major Trading Areas constitute reasonable regional market configurations. The geographic consolidations that have occurred in the cellular industry show that there is a need for personal communications services that are available on a wide-area basis. A Major Trading Area PCS system would be able to respond to this need and would be competitive with these regional cellular networks. A Major Trading Area licensing scheme will lead to more universally available service, because

^{19/} There are 47 Major Trading Areas. The Commission included Alaska and Hawaii to bring the total to 49 Major Trading Areas.

the service will not have to be built up in a patchwork fashion out of smaller market areas that have no relationship to radio coverage or traffic patterns.^{20/} Accordingly, one frequency block should be dedicated to regional PCS service offerings, licensed on the basis of Major Trading Areas, that will be competitive in geographic scope with existing large regional cellular clusters. This could create a competitive alternative to the wide-area cellular networks that have been consolidated from smaller initial configurations over time in response to customer demands for seamless regional service. The large size of Major Trading Areas would facilitate the use of higher power where that is responsive to customer demands, and it will also allow systems to be deployed more rapidly, resulting in quicker establishment of service.

U S WEST also believes that MSAs and RSAs, which have been developed over the years as licensing areas for cellular service,^{21/} should be utilized. Their relatively compact size is appropriate for applying new technology better suited for more localized services. While they are numerous, the Commission has grown very skillful at expeditiously processing cellular applications designed for these markets. Thus, these too could lead to rapid PCS deployment. Providing for three MSA/RSA-based licensees will allow a wider range of services to be offered. MSA/RSA-based PCS licenses could encourage investment in technologies designed for meeting customer needs in a particular area, such as low-power

^{20/} U S WEST notes that LATAs are wholly unsuitable for defining radio service areas. In cellular service, LATA boundaries have been a major source of difficulty because they are not logically related to customer mobility patterns. As in cellular, U S WEST has also seen in the toll markets that consumers do not understand LATAs. While LATA boundaries best match Regional Holding Company ("RHC") telephone service territories, we do not believe they are in the public interest.

^{21/} See *Rural Cellular Service*, CC Docket 85-388, *Notice of Proposed Rulemaking*, 51 Fed. Reg. 405 (Jan. 6, 1986); *First Report and Order*, 60 Rad. Reg. 2d (P&F) 1029; *recon. denied*, 2 FCC Rcd. 733 (1987), *recon. in part*, 2 FCC Rcd. 3366, *erratum*, 2 FCC Rcd. 4008, *further recon. in part*, 4 FCC Rcd. 5272 (1988), *recon. in part*, 3 FCC Rcd. 4403.

microcell systems. Such systems are efficient vehicles for meeting customers' need for wireless data transmission, and they can be a highly effective means of providing service that will be competitive in price and quality with landline local exchange service. Moreover, MSA/RSA licensing could lead to a wider variety of providers. Smaller license areas would require a lower initial capital investment for a given technology than large areas, thereby facilitating the entry of smaller entrepreneurial firms with different innovative approaches to PCS.

Both Major Trading Areas and MSAs/RSAs have significant merit for PCS licensing, but they would very likely result in different approaches to the provision of PCS services. That very difference is why U S WEST proposes that one block of spectrum be licensed on the basis of Major Trading Areas, while the other three blocks of spectrum are licensed according to MSAs and RSAs. This would allow the Commission to provide incentives to system developers to pursue diverse approaches to PCS without mandating the use of particular technical solutions.

**C. PCS Licensees Should Be Selected By
Qualified Lotteries Without Any Restriction
On Alienation**

The lottery process may be the only realistic selection procedure which will assure that PCS is expeditiously made available to the public. Absent a process to limit the number of applications and given the number of areas to be licensed, comparative hearings are too time-consuming and cumbersome. Auctions could be a viable alternative. However, auctions would require the enactment of legislation, which appears unlikely to occur soon. Moreover, the implementation of auctions, even with Congressional authorization, would require a further rulemaking proceeding that would delay commencement of the selection process.

The lottery statute requires that applications that are included in the lottery be “acceptable for filing,” and, before granting an application by lottery, the Commission must determine that the applicant is qualified and that the public interest will be served thereby. ^{22/} The lottery process should include a substantial filing fee, ^{23/} and a meaningful financial showing, which would require either that a substantial percentage of construction and operational costs have been placed in an escrow account, or that the applicant has a legally binding, irrevocable letter of credit or loan commitment from a commercial bank. ^{24/}

If the Commission were to adopt meaningful financial requirements such as these and enforce them, there would be fewer speculative applications. U S WEST recognizes that these requirements could impose significant costs on applicants and temporarily restrict their financial flexibility by tying up funds and credit. However, given the Commission’s objectives, this represents the best approach to ensure that PCS licenses are ultimately held by those most likely to build and operate systems.

^{22/} 47 U.S.C. § 309(i), *added by* Pub. L. No. 97-35, 95 Stat. 357 (1981), *amended by* Pub. L. No. 97-259, 96 Stat. 1087 (1982).

^{23/} The Commission stated in the *NPRM* that it intended to charge a substantial filing fee for entering PCS lotteries. *NPRM*, 7 FCC Rcd. at 5709, ¶¶ 89-90. U S WEST notes that the statutory fee schedule does not provide for the collection of filing fees for PCS. *See* 47 U.S.C. § 158(g). Attempting to charge any filing fee, and particularly a high fee, would surely result in significant legal challenges. U S WEST suggests that the Commission attempt to obtain specific legislative authorization for any PCS filing fee, as has recently been done for low earth orbit satellite systems, in order to avoid the uncertainty and delay that such challenges entail. *See* Telecommunications Authorization Act of 1992, Pub. L. No. 102-____, § 209(a), ____ Stat. ____ [H.R. 6180] (Oct. 27, 1992).

^{24/} The lottery process should first determine all licensees for Major Trading Areas. Thereafter, lotteries for MSAs/RSAs licensees should follow the pattern used by the Commission for cellular licensing.

Without very substantial financial requirements, there appears to be no way for the Commission to deter speculative applications. The measures tried in cellular and other services to date have not achieved this goal, but they have engendered litigation which has delayed the delivery of service. In PCS, the Commission can avoid this result by acknowledging that speculation cannot be completely prevented, seeking to ensure that licensees are selected quickly, and encouraging entities with the expertise and long-term commitment to become PCS licensees.

U S WEST believes that the imposition of deadlines for the completion of initial construction and system build-out after issuance of a construction permit would be an effective way to ensure that products and services are offered to consumers as quickly as possible. This would also avoid the warehousing of spectrum. Applicants should be required to establish in their initial filing how they will satisfy this obligation. The initial construction requirements should be reasonable in terms of population and/or geographical coverage. The build-out period and coverage requirement should be coextensive with the license grant. ^{25/} This would encourage licensees to provide coverage to any areas within the geographic scope of their licenses where there is a potential for economically justifiable service. This would also relieve the Commission of any need to conduct an extensive unserved area licensing process at a later date.

In order to ensure that licenses are put to their best economic use, and thereby provide the most benefits to the public, the Commission should not impose any restrictions on transferability of permits or licenses beyond those required by the Communications Act. That is, the Commission should merely require prior approval of assignments and transfers

^{25/} One possible approach could be to require construction and operation of a system covering fifty percent of population within three to five years after spectrum availability for Major Trading Areas and MSAs, and within seven years for RSAs, with additional coverage requirements during later years in the license term.

in order to determine the qualifications of license holders. ^{26/} It should not impose any rules prohibiting or restricting sales of unconstructed systems, imposing holding periods, or otherwise attempting to regulate "trafficking." At the same time, the Commission should make clear that the required build-out and coverage deadlines will not be extended or waived because a system is sold or a buyer is being sought.

D. The Commission Should Encourage Industry-Developed Standards for Interoperability and Interconnection

PCS systems involve the user, the PCS network provider, and the operators of other networks. Standards are needed to govern the interfaces between these parties — *i.e.*, between the user's handset and the PCS base station and between the PCS system and outside networks, such as the public switched network. ^{27/} U S WEST urges the Commission to encourage the speedy development of these interface standards by industry groups. Substantial efforts are already underway in standards groups such as the ANSI-accredited Committee T1 and TIA Committee TR45. The FCC's prompt announcement that it intends to rely on these privately developed standards will encourage timely establishment of the needed interface standards.

1. Interoperability — Common Air Interface

The need for nationwide PCS interoperability, and thus a common air interface, is clear: to achieve low-cost, mass-market, widely-available service, a PCS handset must be

^{26/} See 47 U.S.C. § 310(d).

^{27/} There are numerous other interfaces that will require standards. For example, PCS licensees may utilize network services provided by others for parts of their internal system infrastructure, such as linking microcells with switches and controllers, databases, et cetera.

capable of being used on a wide variety of PCS networks, not only the user's home network.^{28/} Americans are an increasingly mobile population; it follows that consumers will want to be able to use their handsets and other PCS terminals in multiple areas, or with different service providers. In the cellular industry, the ability of a customer to "roam" virtually anywhere has been an important reason for the broad acceptance of cellular service among the public. The public interest would not be served by FCC policies that leave consumers unable to use their equipment when they move or want to use a different provider's service.^{29/}

It is not necessary that all systems or all PCS applications be interoperable or fully compatible, especially given the wide variety of services that fall within the PCS continuum. For example, a high-speed data terminal need not operate in connection with a voice telephone service PCS. There do, however, need to be defined levels of PCS interoperability — *i.e.*, the types of user terminals that need to be able to communicate with specified types of provider equipment. For example, some degree of interoperability among voice, data, and facsimile terminals may be very important. Allowing voice and low-speed data terminals to be used interchangeably on the same network would clearly benefit the public.

^{28/} Andy McGregor (Northern Telecom, Inc.), Cost Penalties of Multiple Air Interfaces, Committee T1P1.1/92-021, Irving, TX (April 20-24, 1992). The experience of the United Kingdom regarding the failure of three out of four CT-2 licensees confirms that a common air interface is required for a viable mass-market service.

^{29/} The Specialized Mobile Radio Service is a good example of a service where there is no standard for interoperability. As a result of the lack of a common air interface, manufacturers were free to use their own proprietary standards. Once a SMR licensee chooses a vendor, the licensee and its customers are "locked in" to that vendor, whose equipment may be incompatible with other vendors' systems. This impedes roaming and shopping for alternative service suppliers. Recently, the development of "enhanced SMRs", based on a new technical standard, offers the potential for increased interoperability.

Some degree of defined commonality is clearly needed in many situations, and such commonality may not evolve promptly unless the Commission actively encourages the affected industries to develop appropriate interoperability standards. Once that aspect of interoperability has been decided, the specific standards for defining the "common air interface" can be developed.

It is the position of U S WEST, and most of the parties commenting thus far, that standards should be set by the industry. However, this may be an appropriate place for "industrial policy" — *i.e.*, active leadership by government to help industry focus its efforts. Industry groups (*e.g.*, Telocator) and standards organizations (*e.g.*, the T1 and TR45 committees) are currently considering a variety of interoperability requirements and common air interfaces, but until the Commission's direction is clearly indicated, these efforts cannot move to closure.

Consistent with the Commission's desire to bring PCS services to the public as quickly as possible, U S WEST encourages the Commission to establish appropriate target dates for the completion of these standards setting efforts at the same time as it sets the basic policy parameters that will guide the development of standards. If the Commission were to specify in its Report and Order in this proceeding a specified date by which such standards are needed (and perhaps a schedule for providing status reports to the Commission), U S WEST is confident that basic specifications for interoperability and common air interface standards can be timely achieved.

2. Interconnection — Public Switched Network Interface

The FCC proposes to confirm explicitly that PCS licensees have a federally protected right to interconnection, but does not plan at this time to mandate any particular

type of interconnection between PCS providers and the public switched network. U S WEST agrees that this is the appropriate policy.

At the outset, U S WEST notes that interconnection addresses only one limited aspect of the relationship between a PCS licensee and the local exchange companies. PCS licensees need access to the public switched network, of course, but they may also need other services that the local exchange companies can provide. Specifically, local telephone companies have the capability to provide a wide variety of facilities and services collectively described as "infrastructure." The infrastructure needed for delivery of PCS services to the public includes elements such as transport, switching, network intelligence, collection of billing data, and customer validation. Many or all of these services can be most efficiently provided on a wholesale basis by companies with a substantial local network already in place, if the local network is adapted and developed specifically to support PCS infrastructure. A telephone company that has undertaken the necessary development will be capable of delivering to a PCS licensee the use of an infrastructure that takes advantage of significant economies of scope and scale due to use of its existing local exchange network. PCS infrastructure can be most efficiently provided if multiple PCS operators share a common infrastructure, given the economies of scale involved. This shared infrastructure is entirely distinct from the actual interconnection of a PCS system with the public switched telephone network.

There will very likely be a wide variety of interconnections used for the PCS/network interface. Different forms of interconnection will be appropriate for different types of PCS systems and providers. One initial form of interconnection that will likely be used for some PCS systems will resemble the Type 2 interconnection used in the cellular industry.